DRAFT
PROPOSED ACTION MEMORANDUM
SITEWIDE TREATMENT FACILITY

U S DEPARTMENT OI ENERGY
Rocky Flats Environmental Technology Site
Golden Colorado

May 1995

DRAFT
PROPOSED ACTION MEMORANDUM
SITEWIDE TREATMENT FACILITY

U.S. DEPARTMENT OF ENERGY
Rocky Flats Environmental Technology Site
Golden, Colorado

May 1995

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF FIGURES

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF ACRONYMS

AEA	Atomic Energy Act
ARA	Accelerated Response Action
ARAR	Applicable or Relevant and Appropriate Requirements
BDAT	Best Demonstrated Available Technology
Be	beryllium
CCR	Colorado Code of Regulations
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CHWA	Colorado Hazardous Waste Act
DOE	Department of Energy
EPA	Environmental Protection Agency
FTU	Field Treatability Unit
GAC	granular activated carbon
gpm	gallons per minute
HSP	Health and Safety Plan
IAG	Inter-Agency Agreement
IHSS	Individual Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
mg/ℓ	milligrams per liter
OU	Operable Unit
PAM	Proposed Action Memorandum
pCi/ℓ	picocuries per liter
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RFETS	Rocky Flats Environmental Technology Site
RI	remedial investigation
SAP	Sampling and Analysis Plan
STF	Sitewide Treatment Facility
U	uranium
U S C	United States Code
UV	ultraviolet
VOCs	volatile organic compounds
WAC	waste acceptance criteria

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this Proposed Action Memorandum (PAM) is to request and document approval of the Department of Energy's (DOE's) proposed Accelerated Response Action (ARA) to construct and operate a Sitewide Treatment Facility (STF) at the Rocky Flats Environmental Technology Site (RFETS) This ARA involves consolidating contaminated water sources from Operable Unit (OU) numbers 1, 2, 4, 5, and 7 for treatment at the existing OU1 treatment facility, modified to remove contaminants from these OUs Other contaminated waters may be treated at the STF if their chemical quality meets the Waste Acceptance Criteria (WAC) for the facility The purposes of this action are to reduce short-term and longer-term worker exposure risks from operation of multiple facilities and to realize capital and operating cost efficiencies by eliminating redundant treatment capacity This ARA is also consistent with future long-term cleanup plans for these OUs (and possibly others) because treatment capacity for all contaminants of concern (metals, organics, and radionuclides) will be provided

The STF is an ARA as defined in the proposed language to modify the current Inter-Agency Agreement (IAG), i e , a remedial response action that all parties (DOE, Environmental Protection Agency, Region VIII [EPA], and Colorado Department of Public Health and Environment [CDPHE]) agree is necessary and appropriate to mitigate a threat or potential threat to public health or environment, and can be implemented in 6 months The PAM is the primary document used by DOE in making its decision to undertake the action and, therefore, substantiates the need for and the methodology for the action

1.2 JUSTIFICATION FOR THE PROPOSED ACTION

This proposed action is justified based on safety, environmental and cost considerations Principal arguments for proceeding with this action are summarized below

- The consolidation of contaminated water from multiple OUs for treatment at a centralized location will reduce overall short-term and long-term worker exposure risks by reducing or eliminating operator exposure to contaminants which would otherwise occur managing these contaminated waters at each of the OUs

- Construction at one physical location will preclude potential future environmental impacts at other OUs

- Obvious cost efficiencies are realized by eliminating redundant treatment capacity Costs will be reduced by eliminating future design, siting, capital and operating costs at other OUs

1.3 DOCUMENT ORGANIZATION

Section 2 of this document describes the proposed contaminated water sources initially to be collected and treated at the STF and summarizes the chemical characteristics of each of these sources Section 3 summarizes the performance standards upon which the implementation the STF will be based These performance standards address compliance with chemical-, location-, and action-specific regulatory requirements [Applicable or Relevant and Appropriate Requirements (ARARs)] for RFETS

2.0 SITE CHARACTERIZATION

2.1 PHYSICAL LOCATION AND LAND USE

RFETS is located in rural northern Jefferson County approximately 16 miles northwest of Denver Cities within a 10-mile radius from the center of RFETS include Boulder to the northwest, Broomfield, Lafayette, and Louisville to the northeast, Westminster to the east, Arvada to the southeast, and Golden to the south Approximately 50% of the area within 10 miles of RFETS is in Jefferson County, 40% in Boulder County, and 10% in Adams County

RFETS consists of approximately 6,500 acres of federally owned land in Township 2 South, Range 70 West, Sections 1 to 4 and 9 to 15, 6th Principal Meridian (T2S R70W 1-4, 9-15, 6PM) A secured area of approximately 400 acres is centrally located within RFETS The secured area is surrounded by a buffer zone of approximately 6,150 acres in area

RFETS is a government-owned, contractor operated facility that is part of the nationwide nuclear weapons production complex Until January 1992, RFETS was operated as a nuclear weapons research, development, and production complex RFETS fabricated nuclear weapons components from plutonium, uranium, beryllium (Be), and stainless steel Support activities included chemical recovery, purification of recyclable transuranic radionuclides, and research and development of metallurgy, machining, nondestructive testing, coatings, remote engineering, chemistry, and physics The RFETS is currently a Resource Conservation and Recovery Act (RCRA) hazardous waste treatment/storage facility RFETS is in transition from a defense production facility to a facility that will be used for such

future missions as environmental restoration, waste management, maintaining production contingency, and eventually decontamination and decommissioning

There is little residential or commercial development within a 4-mile radius of the center of RFETS Approximately 9,100 people reside within a 5-mile radius Approximately 316,000 people reside within a 10-mile radius The population within a 50-mile radius is approximately 2 2 million

Generally, those areas closest to RFETS are zoned for industrial development and those farther away are zoned for residential development Since 1973, several new residential subdivisions have been developed to varying degrees within a few miles of the buffer zone, particularly to the east and southeast Additionally, several ranches are located within 10 miles of RFETS These ranches are associated with equestrian activities and produce crops, beef cattle, and milk Two small cattle herds of approximately 10 to 20 cattle each are located southeast and east of RFETS The predominant uses immediately southeast of RFETS appear to be open space, single family detached dwellings, and horse boarding operations In all, 70 parcels in Jefferson County surrounding RFETS to the east, south, and west have been identified and designated The land use data are summarized in Table 2-1 Land to the north is in Boulder County and has not been identified

Table 2-1

Jefferson County Land Use Surrounding RFETS

Number of Parcels	Land Use Type	Generalized Zoning
11	Single Family Detached	Agricultural, Planned Development, Residential
30	Industrial	Industrial, Planned Development, Mining-Conservation
4	Office/Retail	Restricted Commercial, Planned Development
1	Mining	Mining-Conservation
1	Farm/Ranching	Agricultural
5	Water/Utilities	Agricultural, Industrial, Mining-Conservation
18	Vacant or not designated	Agricultural, Industrial

Adapted from DOE, 1994a, App F, Table F4-1 Original Source Jefferson County Land Use Inventory

2.2 PHYSICAL ENVIRONMENT AND ECOLOGY

There are no floodplains, natural wetlands, or historical/archeological features at OU1 OU1 is not intended for development of any unique natural resource There is a constructed wetland located in the vicinity of OU1, which was built because of damage to wetlands during construction of the french drain, an Interim Measure/Interim Remedial Action (IM/IRA) implemented at OU1 Wetlands occur along Woman Creek and Pond C-2, which are south of OU1 The wetlands will not be affected by this proposed action

Preliminary studies conducted to date have not indicated the presence of unique ecosystems at the RFETS The bald eagle (endangered), black footed ferret (endangered), peregrine falcon (threatened), and whooping crane (endangered) were identified by the U S Fish and Wildlife Service as potentially present at RFETS (Peregrine falcons nest on high cliff sides and river gorges, which are absent at RFETS Peregrine falcon nesting sites have been recorded 4 to 5 miles west of the site) However, the U S Fish and Wildlife Service found no adverse affects on endangered species resulting from current activities at OU1

2.3 SITE DESCRIPTIONS/CONTAMINATED WATER SOURCES

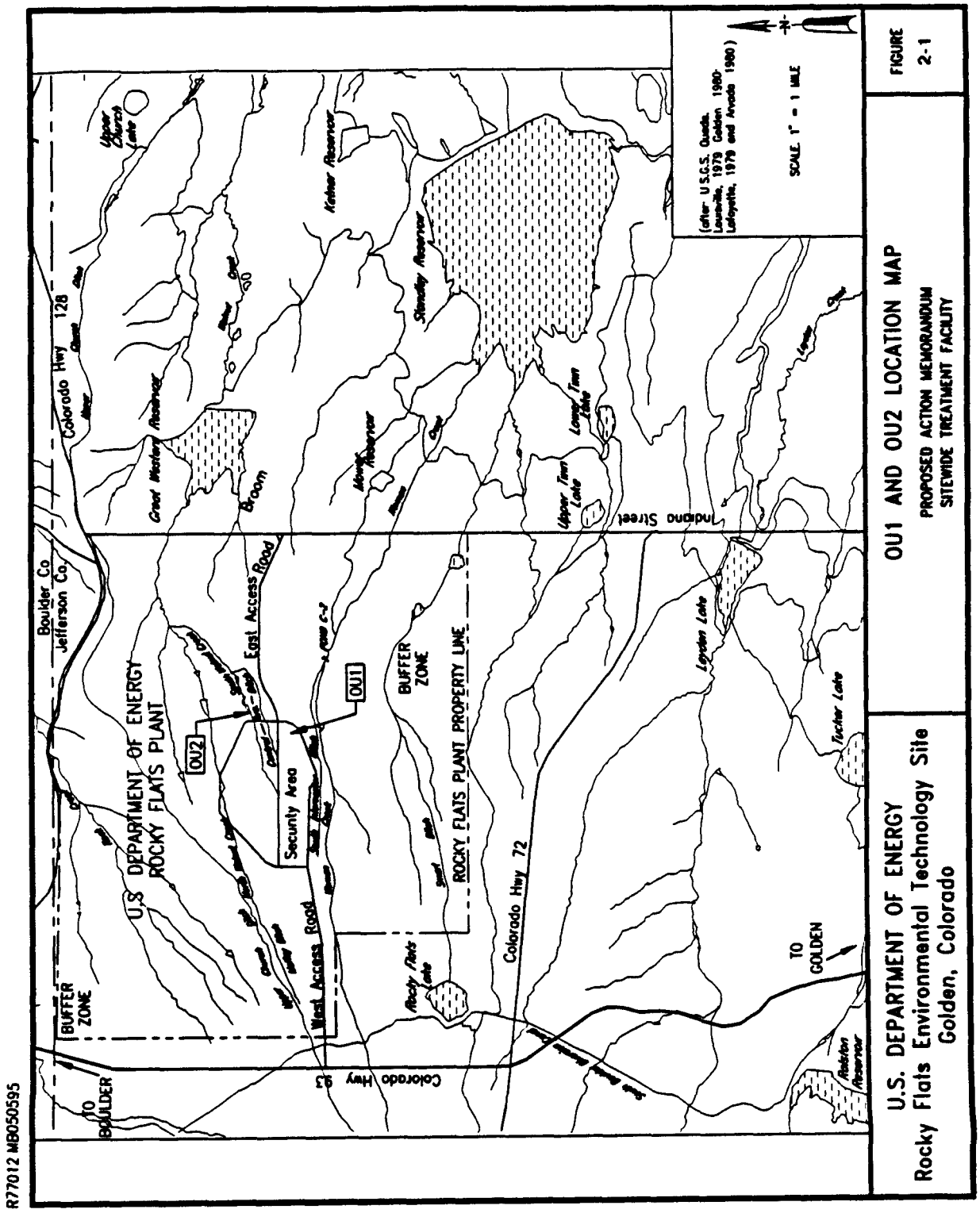
The OUs initially affected by this proposed action are OUs 1, 2, 4, 5, and 7 The location of these OUs within the RFETs plant boundaries is illustrated in Figure 2-1 Brief descriptions of these OUs are provided below

OU1 — 881 Hillside Area

The main concern at OU1 is the contamination of groundwater and soil by volatile compounds (VOCs) Prior to 1972, workers stored drums containing solvents on the ground east of Building 881, subsequently, some of the containers leaked Other Individual Hazardous Substance Sites (IHSSs) at OU1 include chemical waste pits, an outfall area, out-of-service fuel tanks, and buried, radionuclide-contaminated soils

OU2 — 903 Pad, Mound, and East Trenches Areas

Former waste storage practices resulted in contamination of soil, surface water, and groundwater at OU2 At the 903 Pad, drums containing plutonium-contaminated lathe coolant were stored on the ground, later, these drums were removed and the area was capped with asphalt At the Mound area, similar drums were buried and later removed While the drums existed at these two areas, some leaks occurred, and soil removal may have resulted in wind dispersion of contaminants At the East Trenches Areas, drums containing radioactive waste and sanitary



R770I2 MB050595

sewage sludge were buried, some of which remain in the trenches Also, sewer plant effluent was spray irrigated on nearby land The variety of contaminants at OU2 include VOCs, other organics, radionuclides, and metals

OU4 — Solar Evaporation Ponds

The Solar Evaporation Ponds were used to store low-level radioactive waste, sanitary treatment plant effluent, and contaminated groundwater collected downgradient of the ponds Leaks from the ponds contributed radionuclides, metals, nitrates, acids, and bases to the groundwater and soil

OU5 — Woman Creek Drainage

OU5 consists of potentially contaminated surface water, stream sediments, stream sediments, and soil in the Woman Creek drainage Radionuclides, metals, and nitrates from OU1 and OU2 may have migrated into OU5. There are several types of IHSSs including an old landfill, ash pits, and retention ponds

OU7 — Present Landfill

The soil and groundwater in this area may contain various contaminants such as VOCs and metals The landfill is still being used, and only nonhazardous sanitary solid waste currently is disposed in it

Table 2-2 summarizes the contaminated water sources and flows from each OU to be treated at the STF These sources would be accepted at the STF in accordance with approved WAC. The following subsections describe each of these sources in more detail

2.3.1 Operable Unit Number 1

Previous actions at OU1 included implementation of an IM/IRA to collect and treat contaminated groundwater, which began operation in April 1992 Figure 2-2 illustrates the plot plan for the OU1 IM/IRA Groundwater is collected by a downgradient french drain as well as from an extraction well, and is treated by a system consisting of ultraviolet (UV)/peroxide oxidation for removal of organics, and ion exchange for removal of trace metals and salts Treated groundwater is discharged to surface water after it has been treated to meet ARARs established for OU1 The current treatment system capacity is 30 gallons per minute (gpm) The current flow rate from the IM/IRA is 2,000 to 2,500 gallons per week (0 2 to 0 25 gallons per minute)

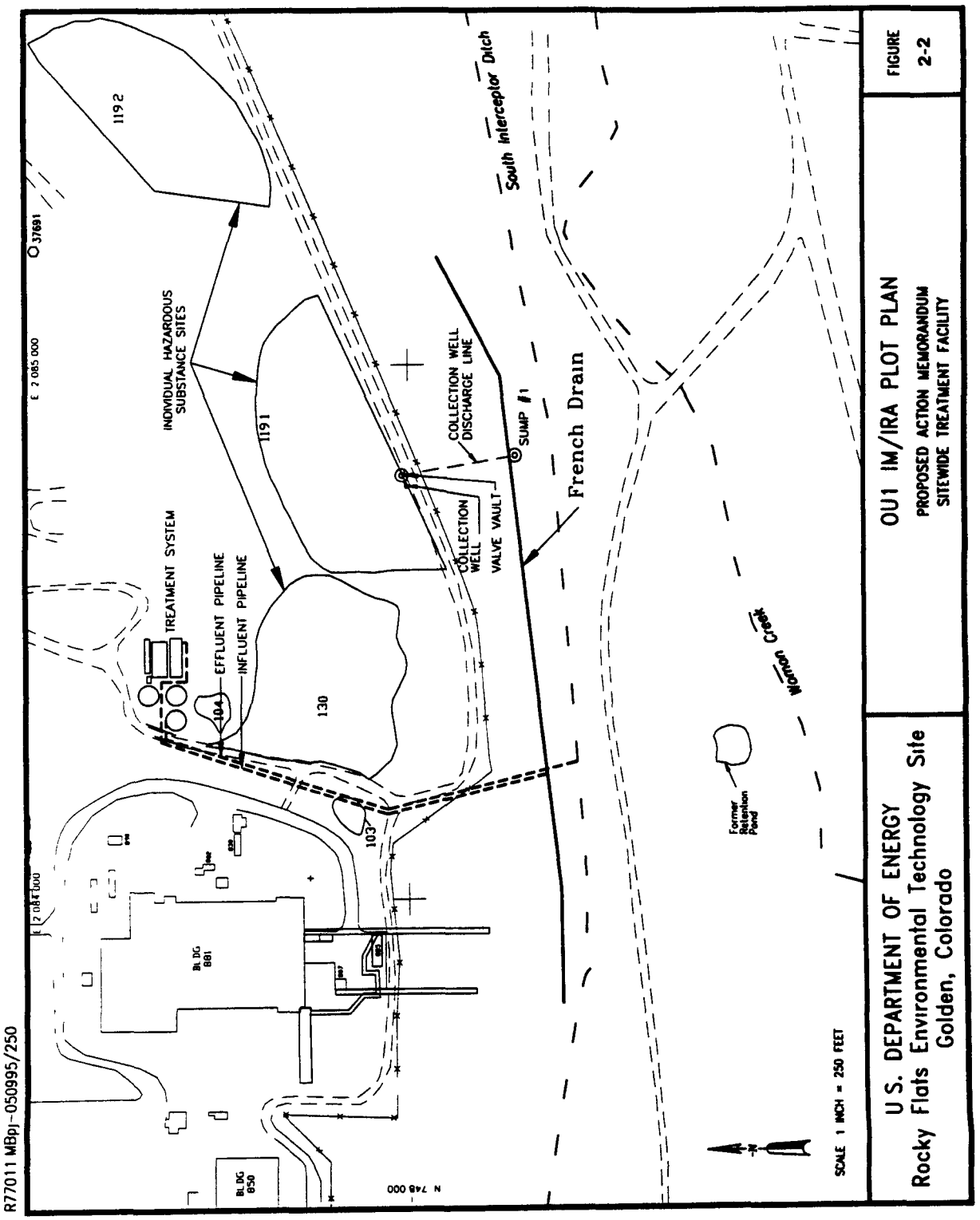

1192
1191
130
103
104
37691
E 2 085 000
E 2 084 000
N 748 000
INDIVIDUAL HAZARDOUS SUBSTANCE SITES
TREATMENT SYSTEM
EFFLUENT PIPELINE
INFLUENT PIPELINE
COLLECTION WELL DISCHARGE LINE
COLLECTION WELL VALVE VAULT
SUMP #1
South Interceptor Ditch
French Drain
Woman Creek
Former Retention Pond
BLDG 881
BLDG 850
SCALE 1 INCH = 250 FEET
OU1 IM/IRA PLOT PLAN
PROPOSED ACTION MEMORANDUM
SITEWIDE TREATMENT FACILITY
FIGURE 2-2
U.S. DEPARTMENT OF ENERGY
Rocky Flats Environmental Technology Site
Golden, Colorado
R77011 MBp1-050995/250

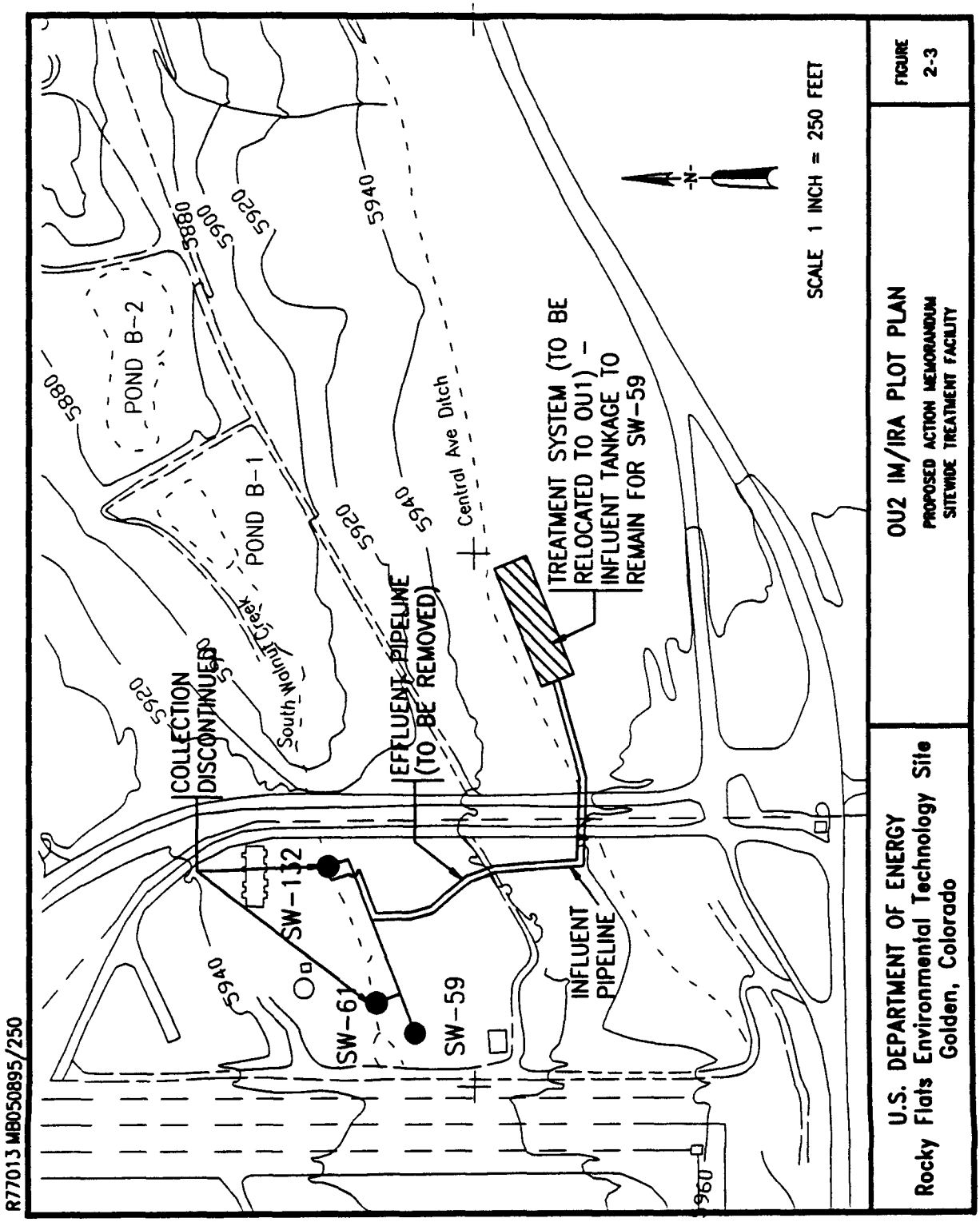
Table 2-2

Summary of Proposed STF Contaminated Water Sources and Corresponding Flow Estimates

OU Number	Description of Source	Flow Estimates (gpm)
1	Groundwater from IM/IRA	0 2 - 0 25
2	Surface Water Station SW-59	0 07
4	Groundwater from Interceptor Drains	5 7
5	Stormwater and landfill leachate plus purge water from monitoring wells	3 4
7	Surface water seep SW-097	3 4
Decon Pad	Decontamination wastewater from RFI/RI activities plant-wide	0 13 - 0 19

2.3.2 Operable Unit Number 2

An IM/IRA is also in progress at OU2 for the treatment of surface water identified as seep SW-59 Treatability studies were conducted in two phases during 1992 and 1993 with the objectives of evaluating the chemical characteristics of water at SW-59 as well as at nearby stations SW-61 and SW-132 The effectiveness of a field treatability unit (FTU) in achieving the ARARs identified for OU2 was also evaluated Figure 2-3 illustrates the plot plan for the OU2 FTU The treatment units employed by the FTU consisted of microfiltration for the removal of metals and radionuclides, and granular activated carbon (GAC) for the removal of organics The results of the treatability studies indicated that it was not necessary to continue to collect and treat SW-61 and SW-132 The conclusion was drawn because stations SW-61 and SW-132 only occasionally exceeded OU2 ARARs and the cost of treatment and waste management for these sources was prohibitive Collection of these two sources was discontinued in _____, 1994 with the concurrence of the Environmental Protection Agency and the Colorado Department of Public Health and Environment Surface water station SW-59 continues to be collected and treated using the OU2 FTU The average flow from SW-59 is 100 gallons per day (0 07 gallons per minute)


POND B-2
POND B-1
South Walnut Creek
Central Ave Ditch
5880
5900
5920
5940
5960
COLLECTION DISCONTINUED
EFFLUENT PIPELINE (TO BE REMOVED)
TREATMENT SYSTEM (TO BE RELOCATED TO OU1) - INFLUENT TANKAGE TO REMAIN FOR SW-59
SW-132
SW-61
SW-59
INFLUENT PIPELINE
SCALE 1 INCH = 250 FEET
N
U.S. DEPARTMENT OF ENERGY
Rocky Flats Environmental Technology Site
Golden, Colorado
OU2 IM/IRA PLOT PLAN
PROPOSED ACTION MEMORANDUM
SITEWIDE TREATMENT FACILITY
FIGURE 2-3
R77013 MB050895/250

2.3.3 Operable Unit Number 4

Contaminated water is currently generated from the recovery of groundwater by a network of interceptor drains located on the hillside north of the Solar Ponds Recovered water from the interceptor drains has, over the years, been treated using the RFETS mixed waste treatment facilities located in Building 374 (RCRA Unit No ____) Treatment of this source at the STF is being considered because Building 374 does not have capacity for treating organic contamination The estimated flow from this source is 3 million gallons per year (5 7 gallons per minute)

2.3.4 Operable Unit Number 5

The principal potential source of contaminated water from this OU will consist of stormwater and leachate from a landfill planned within the OU boundaries The estimated maximum daily flow from these sources would be 10 gallons per minute In the interim, and likely during the operation of the landfill, contaminated water from the purging of groundwater monitoring wells will be generated The volume of contaminated water from this latter source is insignificant when compared to the future source

2.3.5 Operable Unit Number 7

There are plans currently for the closure of the old landfill and the construction of a new landfill Contaminated water from this OU will be from a seep identified as surface water monitoring station SW097 The anticipated flow from this source will range from 2 to 7 gallons per minute

2.3.6 Miscellaneous Contaminated Water Sources

The primary source of non-specific contaminated water proposed for treatment at the STF includes decontamination water from the OU1 decontamination facility The estimated flow of decontamination water ranges from 70,000 to 100,000 gallons per year (0 13 to 0 19 gallons per minute) Other investigation-derived decontamination and purge water from RFI/RI activities throughout the plant site is proposed for treatment at the STF where it meets waste acceptance criteria The flow of water from these sources would be insignificant when compared to other sources

2.4 CHARACTERIZATION OF CONTAMINATION

Tables 2-3 through 2-8 provide statistical summaries of the available analytical data for the proposed contaminated water sources for the STF This section provides a narrative summary of these analytical results

2.4.1 Operable Unit Number 1 Groundwater

Table 2-3 summarizes the available analytical data for the influent to the existing OU1 treatment facility

Radionuclides

OU1 influent is characterized by gross beta and total uranium slightly elevated over their ARAR of 5 pCi/ℓ Americium-241, plutonium-239/240, and tritium were not detected at activities above their respective detection limits Gross alpha was detected in all five samples analyzed but the mean concentration was below ARAR of 7 pCi/ℓ

Organics

Of the 14 volatile organic compounds (VOC) monitored in the influent, only three carbon tetrachloride, tetrachloroethene, and trichloroethene were detectable in eight separate sampling rounds Carbon tetrachloride was detected in one sample round at a value below 10 μg/ℓ, tetrachloroethene was detected in 5 of 8 samples in concentrations ranging between 4 and 7 μg/ℓ, and trichloroethene was detected in 4 of 8 samples in concentrations ranging between 1 and 65 μg/ℓ

Metals

Arsenic, selenium and zinc were the only metals detected in concentrations exceeding detection limits The mean selenium concentration (46 μg/ℓ) exceeds the ARAR of 10 μg/ℓ Mean antimony, cadmium, mercury, and thallium concentrations exceed their respective ARARs However, these ARAR exceedances are artifacts of the method used to calculate the means Means were calculated using all data including nondetects Uniform replacement values equivalent to ½ the detection limit were used for nondetects Because detection limits for antimony, cadmium, mercury, and thallium exceed their respective ARARs, the calculated means exceed the ARARs

Water Quality Parameters

Mean total dissolved solids concentrations exceed the ARAR of 400 mg/ℓ based on 9 samples Other water quality parameters including chloride, nitrate/nitrite, sulfate, and pH are below ARARs on an average basis

2.4.2 Operable Unit Number 2 Surface Water

Characterization data from Station SW-59 is summarized in Table 2-4

Radionuclides

Station SW-59 is characterized as having mean gross beta and uranium in excess of ARARs Other radionuclides exhibit mean activities below ARARs

Organics

Although all of the VOCs with ARARs were detected at least once (with the exception of 1,1,2 trichloroethane) the concentrations of carbon tetrachloride, chloroform, tetrachloroethene, and trichloroethene consistently and significantly exceed their respective ARARs

Metals

Aluminum, iron, manganese and zinc are the only metals detected frequently in concentrations exceeding their respective ARARs

Water Quality Parameters

Mean total dissolved solids (508 mg/ℓ) exceed the ARAR of 400 mg/ℓ based on 75 samples No pH, dissolved oxygen, or nitrate/nitrite data are available

2.4.3 Operable Unit Number 4 Groundwater

Characterization data from Station SW-95 is summarized in Table 2-5

Radionuclides

OU4 groundwater from Station SW-95 exhibits mean gross alpha, gross beta and tritium in excess of ARARs There is no isotopic data for americium, plutonium, or uranium

Organics

Organics have not been analyzed at this station

Metals

Because detection limits exceed ARARs for antimony, cadmium, mercury and thallium, the calculated mean concentrations for these elements exceed ARARs However, none of these metals were detected in concentrations exceeding their respective detection limits Other metals with ARARs were detected, however, their mean concentrations are below ARARs

Water Quality Parameters

Mean nitrate/nitrite (332 mg/ℓ) and total dissolved solids (2,639 mg/ℓ) concentrations exceed their respective ARARs of 10 and 400 mg/ℓ Dissolved oxygen and pH measurements have not been collected

2.4.4 Operable Unit Number 5 Groundwater

The only current source of water from OU5 is investigation-derived groundwater generated from purging groundwater monitoring wells Table 2-6 summarizes the available analytical data from 10 separate locations identified as DW-1 through DW-10 Individual location results have been compiled in Table 2-6 to show the total number of samples, minimum and maximum values for a given contaminant and the mean concentrations averaged from all 10 locations

Radionuclides

Gross alpha and beta exceed ARARs on the average, however, ARARs for specific isotopes are not exceeded on average

Organics

Carbon tetrachloride, chloroform, tetrachloroethene, and trichloroethene are consistently detected Mean concentrations for carbon tetrachloride, chloroform, and tetrachloroethene exceed ARARs The mean trichloroethene concentration does not exceed its ARAR value

Metals

Mean antimony, cadmium and zinc concentrations exceed their respective ARARs.

Water Quality Parameters

Purge water exhibits a mean pH of 9 52 which exceeds the ARAR Other water quality parameters exhibit concentrations below ARARs

2.4.5 Operable Unit Number 7 Surface Water

Characterization data from Station SW-097 is summarized in Table 2-7

Radionuclides

Mean gross beta (10 pCi/ℓ) exceeds the ARAR of 5 pCi/ℓ based on 8 samples The mean activities of americium, plutonium and uranium do not exceed ARARs

Organics

Only a subset of the list of organics with ARARs have been analyzed at Station SW-097 The organics detected at this station include 1,1 dichloroethane, acetone, carbon disulfide, methylene chloride, tetrachloroethene, toluene, trichloroethene, and vinyl chloride Mean concentrations of 1,1 dichloroethane, methylene chloride, tetrachloroethene, and vinyl chloride exceed their respective ARARs

Metals

Mean concentrations of aluminum, antimony, cadmium, iron, manganese, mercury, silver and zinc exceed their respective ARARs

Water Quality Parameters

The mean total dissolved solids concentration (728 mg/ℓ) exceeds the ARAR of 400 mg/ℓ ARARS for other water quality parameters are not exceeded

2.4.6 Miscellaneous Decontamination Water

Table 2-8 summarizes the available data of decontamination water from Station DP00192

Radionuclides

No samples have been analyzed for radionuclides

Organics

Nine samples have been collected for a subset of organic compounds with ARARs Detection limits for these analyses were established at 50 μg/ℓ No organics have been detected at concentrations above this detection limit

Metals

In analysis of this water, detection limits for metals were somewhat high Metals detected over detection limits include barium, chromium, and mercury

Water Quality Parameters

Water quality parameters have not been measured at this station

3.0 COMPLIANCE WITH APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs) AND WASTE ACCEPTANCE CRITERIA

In accordance with the IAG, a performance objective of remedial actions at the RFETS is achieving compliance with ARARs However, as stated in the proposed language to modify the IAG, ARAs "may not be intended to, nor be able to, fully address the threat posed by a release

Table 2-3
Summary of OU1 Contaminated Water Characteristics
Station 891UVINF

ANALYTE	NUMBER OF SAMPLES	NUMBER OF DETECTS > OR = CRQL	MINIMUM	MAXIMUM	MEAN	ARAR	NUMBER ABOVE ARAR
Radiochemistry (pCi/l)							
AMERICIUM 241	6	0	0 00	0.00	0 00	0 05	
GROSS ALPHA	5	5	5 00	7 10	5 10	7	
GROSS BETA	5	5	4.30	8.30	6.16	5	
PLUTONIUM 239/240	6	0	0 00	0.01	0 00	0.05	
TRITIUM	6	0	-87 00	240 00	71 83	500	
URANIUM	5	5	5 01	12.78	8 65	5	
Organics (ug/l)							
1 1 1 TRICHLOROETHANE	8	0	5 00	10.00	5.63	200	
1 1,2-TRICHLOROETHANE	8	0	5 00	10 00	5 63	0 6	
1 1 DICHLOROETHANE	8	0	5 00	10 00	5 63	5	
1 1 DICHLOROETHENE	8	0	5 00	10 00	5 63	0 057	
1,2-DICHLOROETHANE	8	0	5 00	10 00	5 63	0.4	
ACETONE	8	0	10.00	10.00	10.00	50	
CARBON DISULFIDE	8	0	5 00	10.00	5 63	5	
CARBON TETRACHLORIDE	8	1	5 00	10 00	5 63	0.25	
CHLOROFORM	8	0	2.00	10 00	4 00	1 00	
METHYLENE CHLORIDE	8	0	5 00	10 00	5 38	4 7	
TETRACHLOROETHENE	8	5	4.00	7 00	5 63	0.80	
TOLUENE	8	0	5 00	10 00	5 63	1000	
TRICHLOROETHENE	8	4	1 00	65 00	22.88	2.7	
VINYL CHLORIDE	8	0	10 00	10 00	10 00	2.00	
Metals (ug/l)							
ALUMINUM	7	0	11 00	54.50	29 82	87	
ANTIMONY	7	0	10 00	15 00	12.00	6	
ARSENIC	7	2	2.90	14.40	6.87	50	
BARIUM	7	0	67 90	170 00	119.21	1000	
BERYLLIUM	7	0	1 00	1 00	1 00	100	
CADMIUM	7	0	2.00	3 00	2.29	1.5	
CHROMIUM	7	0	2.00	5 87	2.60	10	
COPPER	7	0	5 80	12.75	9 38	16	
IRON	7	0	3 80	74.00	26.09	300	
LEAD	7	0	2.00	2.00	2.00	6.5	
LITHIUM	7	0	11 80	22.20	15.41	2500	
MANGANESE	7	0	1 00	1 80	1 16	50	
MERCURY	7	0	0.20	0.20	0.20	0 01	
MOLYBDENUM	7	0	5 00	15 00	10 02	100	
NICKEL	7	0	4.00	12.46	7 71	40	
SELENIUM	7	3	6.90	111 00	45 99	10	
SILVER	7	0	2.00	6.72	2.96	5.8	
THALLIUM	7	0	1 00	4.00	1 86	0.5	
VANADIUM	7	0	2.40	4.23	3.27	100	
ZINC	7	5	11 60	58.10	31 96	50	
Water Quality Parameters (mg/l)							
CHLORIDE	7	7	10 65	93 77	71 63	250	
NITRATE/NITRITE	7	7	2.81	4.90	4.07	10	
SULFATE	7	7	41 00	114.56	68 88	250	
TOTAL DISSOLVED SOLIDS	9	8	350 00	643 00	494.11	400	
pH	10	10	8 04	8 89	8 30	6.5-9 0	

Table 2-4
Summary of OU2 Contaminated Water Characteristics
Station SW-059

ANALYTE	NUMBER OF SAMPLES	NUMBER OF DETECTS > OR = CRQL	MINIMUM	MAXIMUM	MEAN	ARAR	NUMBER ABOVE ARAR
Radiochemistry (pCi/l)							
AMERICIUM 241	51	8	0.00	0.04	0.01	0.05	
GROSS ALPHA	60	58	-0 71	51 00	6.54	7	
GROSS BETA	60	44	0.25	43 00	7 07	5	
PLUTONIUM 239/240	58	21	0 00	0.14	0 02	0 05	
TRITIUM	59	0	-250.00	310.00	39 37	500	
URANIUM	8	8	5.59	8 19	6.62	5	
Organics (µg/l)							
1 1 1 TRICHLOROETHANE	65	58	0.10	13 00	5 02	200	
1 1,2 TRICHLOROETHANE	65	0	0 60	5 00	1 69	0 6	
1 1 DICHLOROETHANE	65	55	0 40	5 00	1 18	5	
1 1 DICHLOROETHENE	65	55	0.20	4.00	1 98	0.057	
1,2-DICHLOROETHANE	65	1	0.40	2.00	1 06	0 4	
CARBON TETRACHLORIDE	65	53	5 00	180 00	73.42	0.25	
CHLOROFORM	65	59	2.00	92.00	14.72	1 00	
METHYLENE CHLORIDE	65	10	0 10	14.00	0.82	4.7	
TETRACHLOROETHENE	65	57	1 00	72.00	30 97	0 80	
TOLUENE	65	2	0 10	5 00	0.58	1000	
TRICHLOROETHENE	65	56	1 00	86.00	34.02	2.7	
VINYL CHLORIDE	65	6	0.20	8.00	1 13	2.00	
Metals (µg/l)							
ALUMINUM	119	21	11 00	21000.00	492.22	87	
ANTIMONY	119	0	11 20	72.10	14.87	6	
ARSENIC	119	0	1 00	5 00	1 58	50	
BARIUM	119	4	99 00	363 00	164 95	1000	
BERYLLIUM	119	0	0.20	1.40	0 91	100	
CADMIUM	119	0	1 60	20.50	2.95	1.5	
CHROMIUM	119	1	1 80	10.40	2.31	10	
COPPER	119	0	1 00	21 30	5.21	16	
IRON	119	35	2.00	12900.00	361.27	300	
LEAD	119	7	0 90	31 60	1 92	6.5	
MANGANESE	119	67	1 00	2100 00	164.32	50	
MERCURY	119	1	0.20	0.24	0.20	0 01	
NICKEL	119	0	5 70	17 10	6.07	40	
SELENIUM	119	0	1 00	4 40	1 89	10	
SILVER	119	0	2.00	2.00	2.00	3 8	
THALLIUM	119	0	1 00	4 50	1 77	0.5	
VANADIUM	119	0	1.50	24.80	5.27	100	
ZINC	119	92	9 60	1020.00	187 15	50	
Water Quality Parameters (mg/l)							
CHLORIDE	76	76	49 00	170.00	66.66	250	
SULFATE	74	74	19 00	55 00	34.29	250	
TOTAL DISSOLVED SOLIDS	75	75	370.00	710.00	508 08	400	

OU4

Table 2-5
Summary of OU4 Contaminated Water Characteristics
Station SW095

ANALYTE	NUMBER OF SAMPLES	NUMBER OF DETECTS > OR = CRQL	MINIMUM	MAXIMUM	MEAN	ARAR	NUMBER ABOVE ARAR
Radiochemistry (pCi/l)							
GROSS ALPHA	6	6	20 00	150 00	66.00	7	
GROSS BETA	6	6	15 00	110.00	55 67	5	
TRITIUM	5	5	950 00	1100 00	1046.00	500	
Metals (ug/l)							
ALUMINUM	9	2	41 80	99 50	80 50	87	
ANTIMONY	9	0	11.20	24.40	17 62	6	
ARSENIC	9	0	1 00	2.00	1.40	50	
BARIUM	9	5	135 00	169 00	144.45	1000	
BERYLLIUM	9	1	0.20	1.20	0 75	100	
CADMIUM	9	0	1 60	5 10	2.33	1.5	
CHROMIUM	9	0	1 80	4.40	2.56	10	
COPPER	9	2	2.40	5 18	3 66	16	
IRON	9	7	95 60	253 00	139.41	300	
LEAD	9	5	0 90	4 76	2.12	6.5	
LITHIUM	9	9	242.00	320 00	275 08	2500	
MANGANESE	9	2	5 00	5.51	4.58	50	
MERCURY	9	1	0.20	0.22	0.20	0 01	
MOLYBDENUM	9	0	2.50	7 70	4.91	100	
NICKEL	9	1	6.40	12.30	9.59	40	
SELENIUM	9	6	4.50	12.60	8 07	10	
SILVER	9	0	2.00	2.90	2.27	5 8	
THALLIUM	9	0	1 00	4.20	2.00	0.5	
VANADIUM	9	0	2.00	4.23	2.92	100	
ZINC	9	2	7 00	10.60	9.40	50	
Water Quality Parameters (mg/l)							
CHLORIDE	1	1	117 00	117 00	117 00	250	
NITRATE/NITRITE	8	8	504.00	570 00	552.38	10	
SULFATE	2	2	168 00	170 00	169 00	250	
TOTAL DISSOLVED SOLIDS	7	7	2200 00	2944.00	2638 71	400	

Table 2-6
Summary of OU5 Contaminated Water Characteristics
Groundwater Purge DW1 through DW10

ANALYTE	NUMBER OF SAMPLES	NUMBER OF DETECTS > OR = CRQL	MINIMUM	MAXIMUM	MEAN	ARAR	NUMBER ABOVE ARAR
Radiochemistry (pCi/l)							
AMERICIUM-241	7	0	0 000	0 000	0 005	0 05	
GROSS ALPHA	61	40	-0 100	150.000	7.496	7	
GROSS BETA	61	59	3 900	190 000	11 891	5	
PLUTONIUM 239/240	6	1	0 000	0 000	0 017	0.05	
URANIUM	7	7	1 3	6.8	5 927	5	
Organics (ug/l)							
1 1 1 TRICHLOROETHANE	58	1	0.200	2.000	0.591	200	
1 1,2-TRICHLOROETHANE	58	0	0.500	6.000	1 353	0 6	
1 1 DICHLOROETHANE	58	1	0.200	2.000	0.599	5	
1 1-DICHLOROETHENE	58	0	0.200	2.000	0.599	0 057	
1,2-DICHLOROETHANE	58	0	0 400	4.000	0 967	0.4	
ACETONE	7	0	1 900	11 000	3 170	50	
CARBON DISULFIDE	2	0	1 700	2.300	2.000	5	
CARBON TETRACHLORIDE	58	21	0 500	62.000	1 614	0.25	
CHLOROFORM	58	31	0.100	8 000	1 337	1 00	
METHYLENE CHLORIDE	58	6	0.200	2.000	0 617	4 7	
TETRACHLOROETHENE	58	25	0.200	11 000	1 329	0 80	
TOLUENE	58	8	0 100	2.000	0.590	1000	
TRICHLOROETHENE	59	30	0.200	59 000	2.132	2.7	
VINYL CHLORIDE	58	0	0.200	2.000	0.599	2.00	
Metals (ug/l)							
ALUMINUM	68	10	11 000	1850 000	55.406	87	
ANTIMONY	68	6	11.200	99.290	21 152	6	
ARSENIC	68	25	1 100	14.600	3 158	50	
BARIUM	68	30	4.160	95 800	25 053	1000	
BERYLLIUM	68	0	0.200	1.400	0 758	100	
CADMIUM	68	7	1 600	7 600	2.599	1.5	
CHROMIUM	68	5	1 800	25 900	3.212	10	
COPPER	68	31	2.000	26.520	7 982	16	
IRON	68	46	5.400	2560 000	122.463	300	
LEAD	68	29	0.900	9 700	2.296	6.5	
LITHIUM	68	29	1.400	48 900	10 946	2500	
MANGANESE	68	57	0 800	406.920	36 928	50	
MERCURY	68	0	0 200	0.200	0.200	0 01	
MOLYBDENUM	68	19	2.500	45.500	10.868	100	
NICKEL	68	8	5 700	96.700	11.556	40	
SELENIUM	68	26	0 800	14.100	3 067	10	
SILVER	68	0	2.000	2.900	2.209	3.8	
THALLIUM	68	0	1 000	6.400	1 743	0.5	
VANADIUM	68	32	2.000	92.800	12.188	100	
ZINC	68	46	6.090	376.920	66.580	50	
Water Quality Parameters (ug/l)							
CHLORIDE	66	66	2.600	60.900	17.429	250	
NITRATE/NITRITE	65	39	0 020	19 700	2.026	10	
SULFATE	67	67	6.000	140.000	39.416	250	
TOTAL DISSOLVED SOLIDS	64	64	46.000	1600 000	36.957	400	
pH	66	66	6.980	11 100	9.518	6.5-9 0	

Table 2-7
Summary of OU7 Contaminated Water Characteristics
Station SW097

ANALYTE	NUMBER OF SAMPLES	NUMBER OF DETECTS > OR = CRQL	MINIMUM	MAXIMUM	MEAN	ARAR	NUMBER ABOVE ARAR
Radiochemistry (pCi/l)							
AMERICIUM 241	16	16	-0 000404	0.02121	0 007	0.05	
GROSS ALPHA	8	8	0 8918	8 639	2.9	7	
GROSS BETA	8	8	5 763	17	10	5	
PLUTONIUM-239/240	16	16	001	0 01806	0 007	0 05	
TRITIUM	19	19	185 4	1500	595	500	
URANIUM	12	12	0 00534	8 044	1 83	5	
Organics (µg/l)							
1 1 1 TRICHLOROETHANE						200	
1 1 2-TRICHLOROETHANE						0 6	
1 1 DICHLOROETHANE	20	17	2	10	6	5	
1 1 DICHLOROETHENE						0 057	
1,2 DICHLOROETHANE						0.4	
ACETONE	20	10	10	220	52	50	
CARBON DISULFIDE	20	1	5	8	3	5	
CARBON TETRACHLORIDE						0.25	
CHLOROFORM						1 00	
METHYLENE CHLORIDE	20	9	5	190	15	4.7	
TETRACHLOROETHENE	20	2	1	1	2	0 80	
TOLUENE	20	19	5	88	38	1000	
TRICHLOROETHENE	20	11	1	4	2	2.7	
VINYL CHLORIDE	20	5	3	11	5	2.00	
Metals (µg/l)							
ALUMINUM	19	16	29	26900	2629	87	
ANTIMONY	18	4	14	60.4	22	6	
ARSENIC	16	8	1 4	5	3	50	
BARIUM	19	19	297	1550	645	1000	
BERYLLIUM	18	2	0 2	1.4	2	100	
CADMIUM	18	4	1	7 8	3	1.5	
CHROMIUM	18	7	2	29 6	10	10	
COPPER	18	8	2	94.9	13	16	
IRON	19	19	81300	135000	81005	300	
LEAD	18	14	1.5	11	5	6.5	
LITHIUM	19	15	54	107	48	2500	
MANGANESE	19	19	1920	2490	1625	50	
MERCURY	18	1	0 1	0.28	0 1	0 01	
MOLYBDENUM	18	6	4	28.5	40	100	
NICKEL	18	5	5	51	18	40	
SELENIUM	18	2	1 1	7	2	10	
SILVER	18	8	2.7	16.7	6	3 8	
THALLIUM						0.5	
VANADIUM	19	12	3 1	211	25	100	
ZINC	19	19	857	16000	2974	50	
Water Quality Parameters (mg/l)							
CHLORIDE	14	14	1 8	66.5	53 65	250	
NITRATE/NITRITE	10	6	0 02	87	0 268	10	
SULFATE	14	5	0.2	29 6	5 064	250	
TOTAL DISSOLVED SOLIDS	15	15	470	870	728 333	400	
pH	5	5	6.8	7 3	7	6.5-9 0	

Table 2-8
Summary of Miscellaneous Contaminated Water Characteristics
Decontamination Pad Station Number DP00192

ANALYTE	NUMBER OF SAMPLES	NUMBER OF DETECTS > OR = CRQL	MINIMUM	MAXIMUM	MEAN	ARAR	NUMBER ABOVE ARAR
Organics (µg/l)							
1 1 DICHLOROETHENE	9	0	50 00	50 00	50.00	0 057	
1,2-DICHLOROETHANE	9	0	50 00	50 00	50.00	0.4	
CARBON TETRACHLORIDE	9	0	50 00	50 00	50 00	0.25	
CHLOROFORM	9	0	50.00	50.00	50 00	1 00	
TETRACHLOROETHENE	9	0	12.00	50.00	45 78	0 80	
TRICHLOROETHENE	9	0	17 00	50.00	46.55	2.7	
VINYL CHLORIDE	9	0	100 00	100 00	100 00	2.00	
Metals (µg/l)							
ARSENIC	14	0	152.00	500.00	265.45	50	
BARIUM	14	5	158 00	2790 00	874.71	1000	
CADMIUM	14	0	1 30	15.20	10.83	1.5	
CHROMIUM	14	5	11 60	89.40	25.29	10	
LEAD	14	0	100 00	215 00	192.14	6.5	
MERCURY	14	2	0.10	7.20	1 76	0.01	
SELENIUM	14	0	147 00	399 00	251 64	10	
SILVER	14	0	2.70	15.20	12.30	3 8	

or achieve final required performance standards and objectives at a contaminated site, and that further response action may be required " Regardless of this "relaxed" ARAR compliance condition for ARAs, the STF will meet all Federal and State ARARs

ARARs are divided into three types· chemical-specific, location-specific, and action-specific ARARs Chemical-specific ARARs are those that set health-based or risk-based concentration limits for soil, groundwater or surface water for specific pollutants Action-specific ARARs set controls or restrictions on particular kinds of activities related to management of hazardous substances or pollutants Location-specific ARARs are regulations that set restrictions on activities or contaminant levels based on unique characteristics of the site Examples of these are standards under the Wilderness Protection Act, the National Register of Historical Places, and the National Flood Insurance Program There are no promulgated Federal or State location-specific ARARs for this action

3.1 CHEMICAL-SPECIFIC REQUIREMENTS

Chemical-specific ARARs for the STF were derived by compiling and comparing ARARs from other site actions (OU1 and OU2 IM/IRAs) and existing site-wide standards Generally, the lowest concentration value for a given element or compound was selected as the initial principal performance standard or ARAR Principal performance standards have been identified for metals, selected organic compounds, physical, biological, and water quality parameters, and radionuclides Tables 3-1, 3-2, 3-3 and 3-4 present these performance standards, respectively

3.2 ACTION-SPECIFIC REQUIREMENTS

Federal action-specific ARARs for this response action include RCRA standards for generators of hazardous waste, for interim status container storage; and for storage and treatment of hazardous waste in tanks (42 U S C Section 6901 et seq , and 40 CFR Parts 262 and 265), OSHA standards for worker protection during hazardous waste site remediations (29 U S C Section 651 et seq , and 29 CFR Part 1910), Atomic Energy Act (AEA) standards for protecting workers in the handling of radioactive material and standards for storage of radioactive material (42 U S C Section 2201 and 10 CFR Parts 820 and 830, and all applicable DOE Orders pursuant to the AEA)

3.3 WASTE ACCEPTANCE CRITERIA (RESERVED)

Table 3-1

Chemical-Specific ARARs
Principal Performance Criteria
For SWTF – Metals

Metal	Sitewide Water Treatment Facility [a] (µg/L)	Sitewide Water Treatment Facility[b] (µg/L)	Source
Aluminum	chronic = 87 (d)		1
Antimony	6 0 (d)	6 0 (TR) (30 day average)	3, 4
Arsenic	50 00	50 (TR) (daily maximum)	3
Barium	1000 00	1,000 (TR) (daily maximum)	3
Beryllium	100 00	4 (TR) (30 day average)	2, 3
Cadmium	chronic = TVS = 1 5 (d)	5 (TR) (daily maximum)	1, 3
Chromium	10 00		
Chromium III	chronic = TVS = 277 (d)	50 (TR) (daily maximum)	1, 3
Chromium VI	chronic = 11 (d)	50 (TR) (daily maximum)	1, 3
Copper	chronic = TVS = 16 (d)	1,000 (TR) (30 day average)	1, 3
Iron	1000 00 300 00(d)	300 (d) (30 day average)	1, 3
Lead	chronic = TVS = 6 5(d)	50 (TR) (daily maximum)	1, 3
Lithium	2500		6
Manganese	chronic = 1000 00	50 (d) (30 day average)	1, 3
Mercury	chronic = 0 1 (d) fish = 0 01 (total)	2 0 (TR) (daily maximum)	1,3
Molybdenum	100		6
Nickel	40 00	100 (TR) (30 day average)	7, 3
Selenium	chronic = 10 (TR)	50 (TR) (daily maximum)	5, 3
Silver	acute = TVS = 3 8 (d)	100 (TR) (daily maximum)	

Table 3-1 (Continued)

Chemical-Specific ARARs
Principal Performance Criteria
For SWTF – Metals

Metal	Sitewide Water Treatment Facility [a] (µg/L)	Sitewide Water Treatment Facility [b] (µg/L)	Source
Thallium	0 5 (d)	0 5 (TR) (30 day average)	4, 3
Vanadium	100		6
Zinc	50 00	5,000 (TR) (30 day average)	7, 3

Footnotes

d = dissolved

TR = Total Recoverable

TVS = Table Value Standard calculated using the average hardness of 143 mg/L
Temporary modifications for Big Dry Creek, Segment 5 only, effective until April 1, 1996

[a] & [b] = The performance criteria for metals may be established as either dissolved or total recoverable

Sources

1 = Statewide aquatic life standard
2 = Statewide agricultural standard
3 = Statewide drinking water standard
4 = Statewide human health based water and fish standard applicable to aquatic life segments
5 = Big Dry Creek, Segment 5 only, temporary modification effective until April 1996 (TR)
6 = OU1 IM/IRA
7 = OU2 IM/IRA

Table 3-2

Chemical-Specific ARARs Principal Performance Criteria for SWTF — Organics

Organics	SWTF Standard (µg/L)	Source
Acetone	50	1
Carbon disulfide	5	1
Carbon tetrachloride	0 25	3
Chloroform	1 00	2
Dichloroethane 1,1	5	1
Dichloroethane 1,2	0 4	1
Dichloroethylene 1,1	0 057	4
Methylene chloride	4 7	3
Tetrachloroethene (PCE)	0 80	3, 4, 5
Toluene	1,000	4, 6
Trichloroethane 1,1,1	200	1
Trichloroethene 1,1,2	0 6	3, 4
Trichloroethene (TCE)	2 70	4, 5
Vinyl chloride	2 00	2

Source

1 = OU1 IM/IRA
2 = OU2 IM/IRA
3 = RFETS site-specific standard
4 = Statewide human health based water and fish standard applicable to aquatic life segments
5 = Segment 5, Big Dry Creek, temporary modification effective until April 1, 1996
6 = Statewide water supply standard

Table 3-3

Chemical-Specific ARARs Principal Performance Criteria for SWTF — Physical, Biological, and Inorganic Parameters

PHYSICAL AND BIOLOGICAL

Parameter	SWTF Standard	Source
Minimum dissolved oxygen (mg/L)	5 0	1
pH (s u)	6 5-9 0	1

INORGANIC

Parameter	SWTF Standard (µg/L)	Source
Chloride	250,000	1
Nitrate/nitrite	10,000	1
Sulfate	250,000	1
Total dissolved solids (TDS)	400,000	2

Sources

1 = RFETS site-specific standard
2 = OU1 IM/IRA

Table 3-4

Chemical-Specific Principal Performance Criteria for SWTF — Radionuclides

Parameter	SWTF Standard pCi/L	Source
Americium (241)	0 05	1, 2
Gross alpha	7	1
Gross beta	5	1
Plutonium (239/240)	0 05	1,2
Tritium	500	1,2
Uranium	5	1

1 = RFETS site-specific standard – Woman Creek
2 = RFETS site-specific standard – Walnut Creek

State action-specific ARARs for the ARA include

1) Colorado Hazardous Waste Act (CHWA) standards for hazardous waste generators and for storage and treatment in tanks (CRS Section 25-15-101 to 25-15-313 and 6 CCR Section 1007-3 Parts 262 and 265) The CHWA regulations directly applicable to this ARA are identical to the federal RCRA standards, however, there are several indirectly applicable CHWA standards that are more stringent. These standards are for hazardous waste generators as well as for treatment, storage, and disposal (TSD) facilities Because the RFETS is both a hazardous waste generator and TSD facility permitted with the State of Colorado, DOE is aware of, and compliant with, these more stringent CHWA regulations

2) Colorado Air Pollution Prevention and Control Act standards for air emissions (CRS Section 25-7-101 to 25-7-609 and 5 CCR Section 1001)

4.0 PROPOSED ACTIONS AND ESTIMATED COSTS

4.1 PROPOSED ACTIONS

4.1.1 Proposed Action Description

The proposed ARA will consist of relocating existing OU2 treatment units (Trailers 900A and 900B) and influent tankage (existing Tank T-200) to a location south of Building 891 at OU1 The purpose of this relocation is to supplement existing OU1 treatment capability with process units for metals and radionuclides removal Consolidating these treatment technologies at one physical location will provide the treatment capability necessary to address all potential contaminants at OUs 1, 2, 4, 5, and 7

Three new tanks will be procured and installed Each tank will be provided with level detection, freeze protection and insulation Tank TK-20 will be a 1,325 gallon cross-linked polyethylene tank which will function as a bulk acid storage tank Two 200 gallon cross-linked polyethylene tanks, TK-21 and TK-22, will be utilized as sulfuric acid and sodium hydroxide mixing tanks, respectively New ancillary equipment and electrical service will be installed to support the new treatment installations This equipment will include metering pumps, mixers in Tanks TK-21 and TK-22, and double-walled piping for sulfuric acid, hydrogen peroxide, and sodium hydroxide feed lines New double-walled piping will be installed for process water All new piping will be installed with leak detection capability

Additional site improvements at OU1 will be necessary to accommodate the new and relocated OU2 equipment A new concrete containment berm with sump will be constructed, as will containment access ramps and a concrete pad for the foundation for Tank T-200

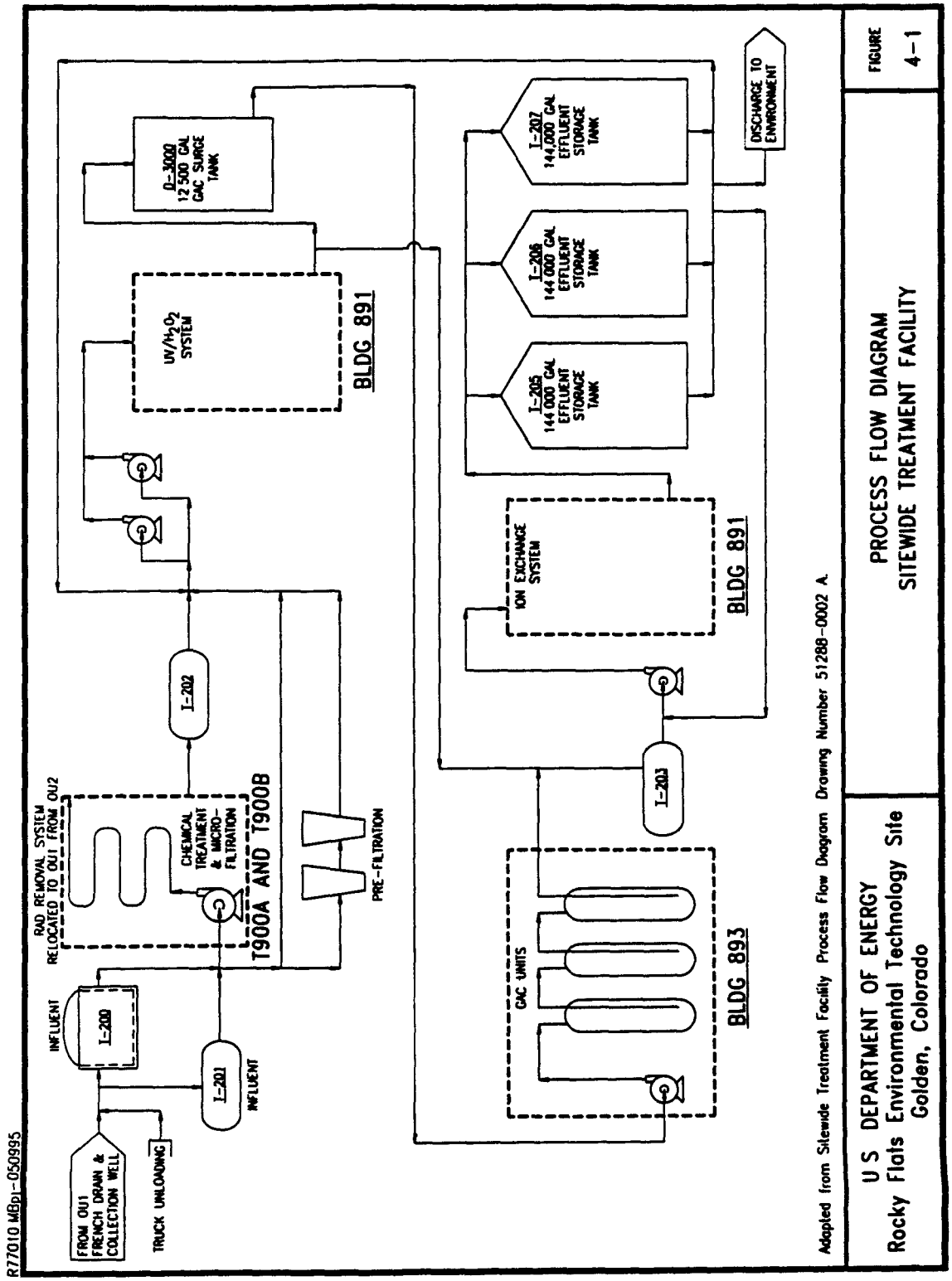
Figures 4-1 and 4-2 present the process flow diagram and operational decision tree for the STF, respectively Influent to the facility will be stored in Tanks T-200 and T-201 and analyzed for radionuclides and metals to determine if the performance standards for each are exceeded If performance standards for either are exceeded, flow will be routed to the rad removal system (chemical treatment/microfiltration) and stored in Tank T-202 for subsequent organics removal If performance standards for radionuclides and metals are not exceeded, flow will either be prefiltered (if suspended solids, iron or slime are present), or routed directly to ultraviolet/peroxide treatment (UV/peroxide) for organics removal UV/peroxide effluent will be stored in Tank D-3000 and tested for refractory organic compounds and dissolved solids concentrations Refractory organics and dissolved solids will be treated as necessary using granular activated carbon (GAC) and ion exchange, respectively Treated effluent will be stored in three 144,000 gallon storage tanks and tested for compliance with performance standards before being discharged at the existing OU1 discharge point

These actions will be conducted in accordance with a site-specific Health and Safety Plan (HSP) and Sampling and Analysis Plan (SAP) by trained RFETS staff The HSP addresses the physical and chemical hazards associated with the work and the SAP includes the details of the field and laboratory analyses that will be employed to address process and compliance monitoring

4.1.2 Contribution to Remedial Performance

The proposed ARA will achieve a high degree of performance, reliability, implementability, and safety In terms of performance, it will employ Best Demonstrated Available Technology (BDAT) in a centralized facility and will be capable of treating all of the contaminants from OUs 1, 2, 4, 5 and 7 Substantial monitoring data collected during OU1 and OU2 IM/IRA operations demonstrates the effectiveness of individual treatment technologies in achieving ARARs It is noted that redundant organic treatment capacity is provided by UV/peroxide and GAC in the planned process flow This "2-stage" organic treatment provides a high level of performance and reliability in reducing organic compound concentrations to levels below ARARs

This action reduces the potential risk to on-site workers associated with remote contaminated water handling and treatment Although the long-term cleanup plans for OUs 1, 2, 4, 5, and 7 have not been formulated, the objectives of permanently reducing health risks and each OU should be consistent with future long-term cleanup plans It is noted that this action is not intended to be a final action for the specific OUs Any remaining contamination will be addressed in the OU Corrective Measures Studies/Feasibility Studies This response action will be performed in less than 6 months


R77010 MBp1-050995
FROM OU1 FRENCH DRAIN & COLLECTION WELL
TRUCK UNLOADING
INFLUENT
I-200
I-201
INFLUENT
RAD REMOVAL SYSTEM RELOCATED TO OU1 FROM OU2
CHEMICAL TREATMENT & MICRO-FILTRATION
T900A AND T900B
PRE-FILTRATION
I-202
UV/H2O2 SYSTEM
BLDG 891
D-3000 12,500 GAL GAC SURGE TANK
I-205 144,000 GAL EFFLUENT STORAGE TANK
I-206 144,000 GAL EFFLUENT STORAGE TANK
I-207 144,000 GAL EFFLUENT STORAGE TANK
DISCHARGE TO ENVIRONMENT
ION EXCHANGE SYSTEM
BLDG 891
I-203
GAC UNITS
BLDG 893
Adapted from Sitewide Treatment Facility Process Flow Diagram Drawing Number 51288-0002 A.
U S DEPARTMENT OF ENERGY
Rocky Flats Environmental Technology Site
Golden, Colorado
PROCESS FLOW DIAGRAM
SITEWIDE TREATMENT FACILITY
FIGURE
4-1

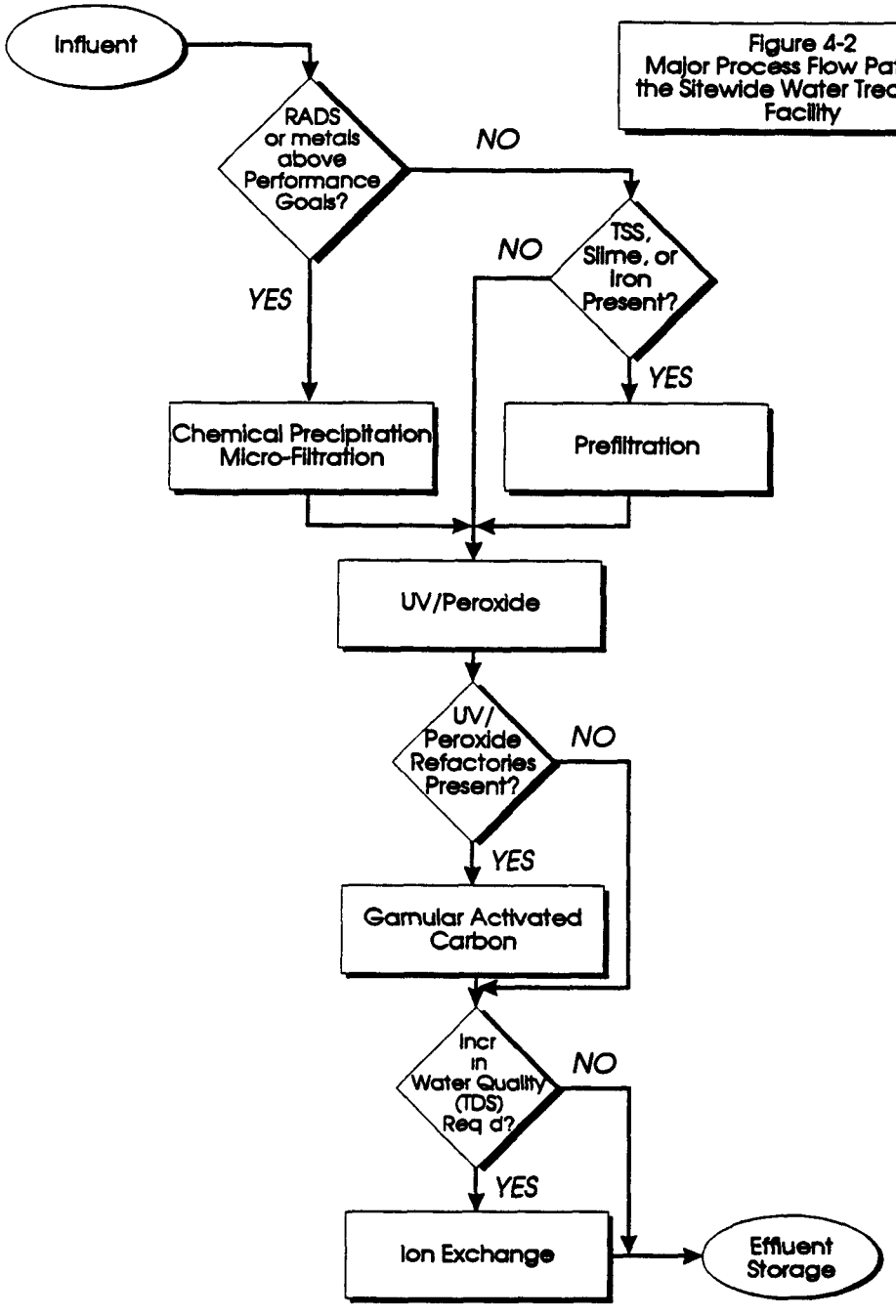


Figure 4-2
Major Process Flow Paths for the Sitewide Water Treatment Facility

4.1.3 Project Schedule

Figure 4-3 presents the schedule of the major tasks and milestones for the STF project System design commenced in January 1995 and was completed in early February 1995 Development of draft waste acceptance criteria and system performance standards also commenced in January 1995 These activities are ongoing as of May 1995 The bid process commenced in March 1995 and was completed in April 1995. This Proposed Action Memorandum is scheduled to be finalized including public comment by 14 August 1995 The finalization of the PAM is scheduled to run concurrently with the STF construction With the concurrence of Region VIII EPA and the CDPHE, the STF is scheduled to be operational on 16 August 1995

4.2 COST

As shown in Table 4-1, the total estimated capital cost for the STF is $1,331,200 The cost estimate considers the cost of project management, planning (including the development of WAC and the preparation of the PAM), design, and construction The estimate does not include STF operation and maintenance costs, nor costs for sampling and analysis or treatment or disposal of residual wastes generated by the STF

Table 4-1

Sitewide Treatment Facility Capital Costs

Capital	Cost ($)
Project Management	235,100
Planning (WAC, PAM)	133,100
Design	260,000
Construction	703,000
TOTAL	1,331,200

ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH	DURATION (days)
DESIGN PROCESS			
Begin Design	1/12/95	2/13/95	23
Design Complete	---	3/3/95	0
ACCEPTANCE CRITERIA			
Develop Draft Acceptance Criteria	1/11/95	5/24/95	95
Final Acceptance Criteria	5/25/95	9/14/95	78
PROCESS EQUIPMENT BID PROCESS			
Advertise Bid	3/15/95	3/27/95	9
Receive Bids	4/10/95	4/10/95	1
Evaluate Bids	4/11/95	4/28/95	10
Award Construction Subcontract	---	4/28/95	0
PROPOSED ACTION MEMORANDUM			
Draft PAM to DOE	5/10/95	5/30/95	1
DOE First Review	5/11/95	5/18/95	6
EG&G Incorporates Comments	5/19/95	6/2/95	10
DOE Submit to State - Prep for Public	6/5/95	6/9/95	5
Public Comment	6/12/95	7/24/95	30
Correct Comments, Submit to State	7/25/95	8/14/95	15
PAM Complete	---	8/14/95	0
INSTALLATION OF PROCESS EQUIPMENT			
Contractor Purchases Equipment	6/1/95	6/21/95	15
Contractor Mobilizes	6/29/95	7/5/95	4
Construction	7/6/95	8/16/95	30
Sitewide Treatment Facility Operational	---	8/16/95	0

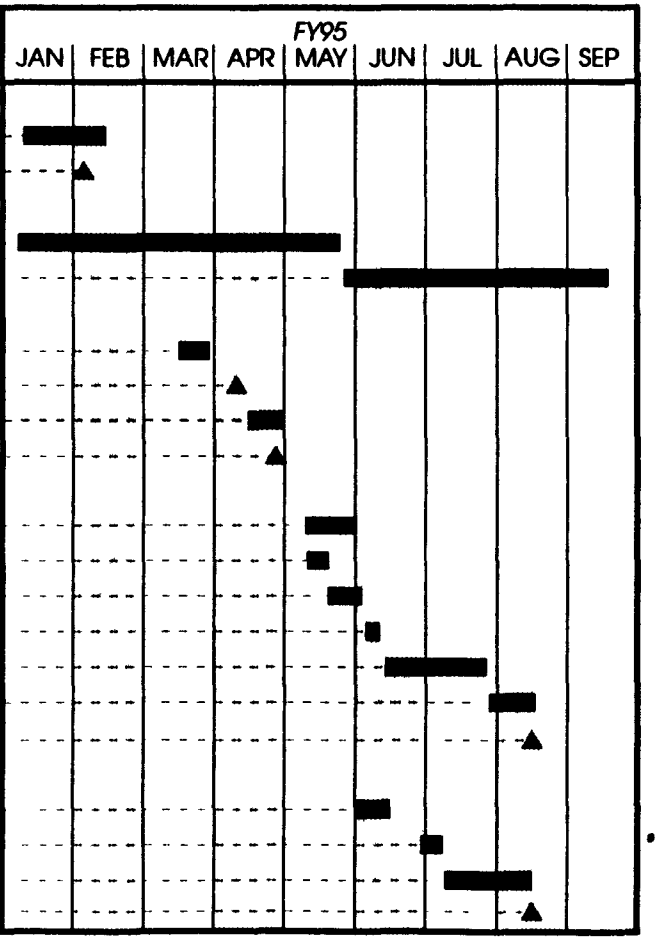


Figure 4-3 Design/Construction of the Sitewide Treatment Facility

■ Activity
▲ Milestone Activity

5.0 REFERENCES

DOE (U S Department of Energy) 1992 Final Background Geochemical Characterization Plan. Department of Energy, Rocky Flats Plant, Golden, Colorado, September 1992

DOE (U S Department of Energy) 1994a Final Phase III RFI/RI Report 881 Hillside Area (Operable Unit No 1) Department of Energy, Rocky Flats Plant, Golden, Colorado, June 1994

DOE (U S Department of Energy) 1994b Final Summary and Analysis of Results, Field Treatability Study, Phase II South Walnut Creek Basin Surface Water Interim Measure/Interim Remedial Action Operable Unit No 2 Department of Energy, Rocky Flats Plant, Golden, Colorado, March 1994

DOE (U.S Department of Energy). 1994c. Final Proposed Action Memorandum, Hot Spot Removal, Revision 1, Rocky Flats Environmental Technology Site (Operable Unit No 1). Department of Energy, Rocky Flats Environmental Technology Site, Golden, Colorado, September 1994

DOE (U S Department of Energy) 1995a Sitewide Treatment Facility, Title II, Technical Specifications Authorization No 989437 Department of Energy, Rocky Flats Environmental Technology Site, Golden, Colorado, March 1, 1995

DOE (U S Department of Energy) 1995b Rocky Flats Plant Sitewide Treatment Facility, Engineering and Technology, Golden, Colorado, Drawings